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Carl J. Roof 37,708  
Name of Attorney Registration No.  
Signature of Attorney *Carl J. Roof*

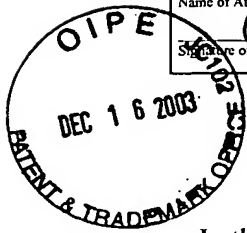


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*[Signature]*

P&G Case 8410M

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of :  
JOHN K. HOWIE, *et al.* : Confirmation No. 5398  
Serial No. 10/058,520 : Group Art Unit 1711  
Filed January 28, 2002 : Examiner SAMUEL A. ACQUAH  
For SYNTHESIS OF POLYOL MEDIUM FATTY ACID POLYESTERS

BRIEF ON APPEAL

Mail Stop Appeal Brief – Patents  
Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Enclosed, pursuant to 37 C.F.R. 1.192(a), is Appellants' Brief on Appeal for the above application. The Brief is being forwarded in triplicate.

The fee for this Brief on Appeal is \$320.00 37 CFR 1.17(c).

The Director is hereby authorized to charge the above fee, or any additional fees that may be required, or credit any overpayment to Deposit Account No. 16-2480 in the name of The Procter & Gamble Company. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

By *Carl J. Roof*  
Carl J. Roof  
Attorney or Agent for Applicant(s)  
Registration No. 37,708  
(513) 634-5209

Date: December 12, 2003

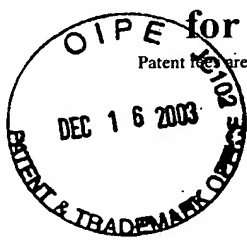
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# FEE TRANSMITTAL

for FY 2002

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## Complete if Known

Application Number	10/058,520
Confirmation Number	5398
Filing Date	January 28, 2002
First Named Inventor	John Keeney Howie, et al.
Examiner Name	Samuel A. Acquah
Group/Art Unit	1711
Attorney Docket No.	8410M

TOTAL AMOUNT OF PAYMENT (\$ 320.00)

## METHOD OF PAYMENT (check one)

1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:
- Deposit Account Number 16-2480  
Deposit Account Name The Procter & Gamble Company
- ☒ Charge Any Additional Fee Required Under status. 37 C.F.R. §§1.16 and 1.17

## FEE CALCULATION

### 1. BASIC FILING FEE – Large Entity

Code (\$)	Fee Description	Fee Paid
101 740	Utility filing fee	<input type="checkbox"/>
106 330	Design filing fee	<input type="checkbox"/>
108 740	Reissue filing fee	<input type="checkbox"/>
114 160	Provisional filing fee	<input type="checkbox"/>
SUBTOTAL (1)		(\$)

### 2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE – Large Entity

		Extra Claims	Fee from Below	Fee Paid
Total Claims	<input type="checkbox"/> - 20** =	<input type="checkbox"/> x	<input type="checkbox"/>	= <input type="checkbox"/>
Independent Claims	<input type="checkbox"/> - 3** =	<input type="checkbox"/> x	<input type="checkbox"/>	= <input type="checkbox"/>
Multiple Dependent			<input type="checkbox"/>	= <input type="checkbox"/>
** or number previously paid, if greater; For Reissues, see below				
Code (\$)	Fee Description			
103 18	Claims in excess of 20			
102 84	Independent claims in excess of 3			
104 280	Multiple dependent claim, if not paid			
109 84	**Reissue independent claims over original patent			
110 18	**Reissue claims in excess of 20 & over original patent			

SUBTOTAL (2) (\$)||

## FEE CALCULATION (continued)

### 3. ADDITIONAL FEES

Code (\$)	Fee Description	Fee Paid
105 130	Surcharge-late filing fee or oath	<input type="checkbox"/>
127 50	Surcharge-late provisional filing fee or cover sheet	<input type="checkbox"/>
139 130	Non-English specification	<input type="checkbox"/>
147 2,520	For filing a request for <i>ex parte</i> reexamination	<input type="checkbox"/>
112 920*	Requesting publication of SIR prior to Examiner's action	<input type="checkbox"/>
113 1,840*	Requesting publication of SIR after Examiner's action	<input type="checkbox"/>
115 110	Extension for reply within 1 <sup>st</sup> month	<input type="checkbox"/>
116 400	Extension for reply within 2 <sup>nd</sup> month	<input type="checkbox"/>
117 920	Extension for reply within 3 <sup>rd</sup> month	<input type="checkbox"/>
118 1,440	Extension for reply within 4 <sup>th</sup> month	<input type="checkbox"/>
128 1,960	Extension for reply within 5 <sup>th</sup> month	<input type="checkbox"/>
119 320	Notice of Appeal	<input type="checkbox"/>
120 320	Filing a brief in support of an appeal	<input checked="" type="checkbox"/>
121 280	Request for oral hearing	<input type="checkbox"/>
138 1,510	Petition to institute a public use proceeding	<input type="checkbox"/>
140 110	Petition to revive - unavoidable	<input type="checkbox"/>
141 1,280	Petition to revive - unintentional	<input type="checkbox"/>
142 1,280	Utility issue fee (or reissue)	<input type="checkbox"/>
143 460	Design issue fee	<input type="checkbox"/>
122 130	Petitions to the Commissioner	<input type="checkbox"/>
123 50	Petitions related to provisional applications (37 C.F.R. 1.17(q))	<input type="checkbox"/>
126 180	Submission of Information Disclosure Statement	<input type="checkbox"/>
146 740	Filing a submission after final rejection (37 CFR § 1.129(a))	<input type="checkbox"/>
149 740	For each additional invention to be examined (37 CFR § 1.129(b))	<input type="checkbox"/>
179 740	Request for Continued Examination (RCE)	<input type="checkbox"/>
169 900	Request for expedited examination of a design application	<input type="checkbox"/>
091 1280	Acceptance of unintentionally delayed claim for priority under 35 U.S.C. 119, 120, 121, or 365 (a) or (c)	<input type="checkbox"/>
Other fee (specify) _____		<input type="checkbox"/>
Other fee (specify) _____		<input type="checkbox"/>

\* Reduced by Basic Filing Fee Paid SUBTOTAL(3) (\$) [320]

## SUBMITTED BY

Name (Print/Type)	Carl J. Roof	Registration No.	37,708	Complete (if applicable)
Signature	<i>Carl J. Roof</i>			Date
				12/12/2003

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Carl J. Roof 37,708  
Name of Attorney Registration No.  
Signature of Attorney



P&G Case 8410M

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of :

JOHN K. HOWIE, *et al.* :

Confirmation No. 5398

Serial No. 10/058,520 :

Group Art Unit 1711

Filed January 28, 2002 :

Examiner SAMUEL A. ACQUAH

For SYNTHESIS OF POLYOL MEDIUM FATTY ACID POLYESTERS

BRIEF ON APPEAL

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Carl J. Roof	37,708
Name of Attorney/Agent	Registration No.
Carl J. Roof	
Signature of Attorney	



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Serial No. 10/058,520 : Group Art Unit: 1711  
Filed: January 28, 2002 : Examiner: SAMUEL A. ACQUAH  
For SYNTHESIS OF POLYOL MEDIUM FATTY ACID POLYESTERS

APPEAL BRIEF

Mail Stop Appeal Brief – Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Appellants hereby appeal to the Board of Appeals the decision of the Examiner dated July 7, 2003, finally rejecting Claims 1-28. This Brief is being filed in triplicate.

REAL PARTY IN INTEREST

The real party in interest is The Procter & Gamble Company, assignee of Appellants' entire right, title and interest in the invention at issue. A copy of this Assignment was recorded at the United States Patent and Trademark Office on March 5, 2002, at reel # 012670, frame # 0090.

RELATED APPEALS AND INTERFERENCES

Appellants, Appellants' undersigned legal representative, and Assignee are not aware of any pending appeals or interferences that would be directly affected by or have a bearing on the Board's decision in the subject Appeal.

STATUS OF CLAIMS

Claims 1-28 are the subject of this appeal. No other claims are pending or allowed. Claims 1-28 were finally rejected in an Office Action dated July 7, 2003 under 35 U.S.C. §102 (b) as being anticipated by each of three cited art references. The Claims on Appeal are set forth in Appendix A.

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### STATUS OF AMENDMENTS

A response to the first Office Action was filed May 5, 2003. In that response, Claim 25 was amended to add the language "and wherein the mixture is heated at a pressure sufficient to maintain a substantially constant reflux rate of the fatty acid ester during the reaction of the polyol and the fatty acid ester." Claims 1-28 were finally rejected in an Office Action dated July 7, 2003. No amendments were submitted after final rejection. A Notice of Appeal was filed on October 7, 2003, and was received by the USPTO on October 14, 2003.

### SUMMARY OF THE INVENTION

The present invention relates to processes for the production of polyol fatty acid polyesters. Specifically, the present invention relates to the production of polyol fatty acid polyesters esterified with fatty groups having a chain length of about 6 to about 14 total carbon atoms. *[page 2, lines 5-11]*. The present inventors have surprisingly discovered that it is these particular chain lengths that result in the formation of a polyol fatty acid polyester having a low pour point, which is advantageous for use in various applications where low pour point temperatures are desirable. *[page 2, lines 22-25]*.

More specifically, the present invention relates to: a process for the preparation of polyol fatty acid polyester, comprising heating a mixture of polyol, fatty acid ester, emulsifying agent and catalyst under conditions sufficient to cause reaction of the polyol and the fatty acid ester, wherein the fatty acid chains of the fatty acid ester have from about 6 to about 14 total carbon atoms, wherein the emulsifying agent comprises a fatty acid soap having fatty acid chains of from about 16 to about 22 total carbon atoms, and wherein the mixture is heated at a pressure sufficient to maintain a substantially constant reflux rate of the fatty acid ester during the reaction of the polyol and the fatty acid ester. *[Claim 1]*. Preferably, the fatty acid chains of the foregoing fatty acid ester have from about 8 to about 12, more preferably from about 8 to about 10, total carbon atoms. *[Claims 4-5]*. Furthermore, the pour point of the polyol fatty acid polyester is not greater than about -15°C. *[Claim 12]*.

As is understood in the art generally, the transesterification reaction of a polyol and a fatty acid ester results in the formation of an alcohol by-product. In order to promote the reaction of the polyol and fatty acid ester, the alcohol by-product is typically removed, preferably by lowering the partial pressure of alcohol in the headspace below that which is in equilibrium with the liquid phase. *[page 8, lines 22-25]*. This can be done by using any of a variety of techniques commonly known in the art, such as application of a vacuum, by inert gas sparging, or both. *[page 8, lines 26-28]*. However, Appellants discovered that because of the relatively low vapor

pressures of the relatively small fatty acid esters used in the present process, employing such techniques not only results in lowering the partial pressure of the alcohol, but also reduces the partial pressure of the fatty acid ester, causing it to vaporize, or 'flash-off.' This is problematic because the fatty acid ester is necessary for esterification onto the polyol. [page 8, line 33 through page 9, line 1]. The present inventors discovered that this inadvertent loss of fatty acid ester can be avoided by refluxing the fatty acid esters, preferably using a condenser. [page 9, lines 1-4]. By maintaining reflux conditions during transesterification, the volatile fatty acid esters are retained, while the alcohol by-product is simultaneously removed. Under these reaction conditions, the desired low pour point polyol polyesters are obtained.

#### ISSUES

Are Claims 1-28 unpatentable under 35 U.S.C. § 102(b) for being anticipated by each of Rizzi, Kenneally and Volpenhein?

#### GROUPING OF CLAIMS

Claims 1-28 are within the same patentable grouping and, therefore, stand or fall together.

#### ARGUMENTS

##### *The Rejection under 35 U.S.C. § 102(b)*

The Examiner has rejected Claims 1-28 under 35 U.S.C. § 102(b) as anticipated by each of Rizzi et al., U.S. Patent No. 3,963,699 (herein Rizzi"), Volpenhein et al., U.S. Patent No. 4,517,360 (herein "Volpenhein"); and Kenneally et al., U.S. Patent No. 5,491,226 (herein "Kenneally"). Appellants respectfully traverse these rejections.

##### A. The Cited Art

The Examiner rejected Claims 1-28 under 35 U.S.C. § 102(b) over Rizzi, Volpenhein and Kenneally. Rizzi generally teaches a solvent free transesterification process comprising heating a mixture of a polyol, a fatty acid lower alkyl ester, an alkali metal fatty acid soap, and a basic catalyst to form a homogeneous melt. Subsequently, excess fatty acid lower alkyl ester is added to the reaction product to yield polyol fatty acid polyesters. See Rizzi, col. 2, lines 23-45. Additionally, Rizzi discloses the use of a vacuum or simple distillation to remove the lower alcohol that forms during the reaction. See Id., col.5, lines 7-19.

Similarly, Volpenhein generally discloses an improved solvent free transesterification process comprising mixing and heating (i) a polyol, (ii) a fatty acid ester selected from fatty acid

methyl, 2-methoxy ethyl or benzyl ester, (iii) an alkali metal fatty acid soap, and (iv) a catalyst selected from potassium carbonate, sodium carbonate or barium carbonate to form a homogeneous melt. Excess fatty acid methyl, 2-methoxy ethyl or benzyl ester is then added to the reaction product to yield polyol fatty acid polyester. See Volpenhein, col. 2, lines 40-60. Furthermore, like Rizzi, Volpenhein discloses the use of vacuum or simple distillation to remove the lower alcohol that forms during transesterification. See Id., col. 5, line 62 through col. 6, line 5.

Finally, Kenneally generally teaches a process for preparing fatty acid methyl esters having levels of triglyceride below 0.5%, and the use of those fatty acid methyl esters in a two-stage, solvent-free transesterification reaction to prepare polyol fatty acid polyesters. Kenneally emphasizes that the use of the fatty acid methyl esters allows the formation of fat-free polyol polyester compositions. See Kenneally, col. 3, lines 1-35.

B. The Examiner's Rejection

As mentioned, the Examiner rejected Claims 1-28 of the present invention under 35 U.S.C. § 102(b) as being anticipated by each of Rizzi, Volpenhein and Kenneally. Specifically, the Examiner points to Rizzi, stating "Patentees clearly disclose that the reaction comprising (i) polyol, (ii) fatty acid lower alkyl ester, (iii) alkali metal fatty acid soap, (iv) basic catalyst, is heated at a temperature from about 110 °C to about 180 °C under a pressure of from about 0.1mm Hg to about 760 mm Hg for a time sufficient to form a homogeneous melt of partially esterified polyol and unreacted starting materials." See Paper 5, Page 2. The Examiner then points out that the present invention has similar reaction conditions to those described in the cited art. Next, the Examiner presumes that "even though the prior art does not mention 'constant reflux' this feature would have been *inherent* [emphasis added] in the prior art process because of the reaction conditions." The Examiner concludes by citing similar disclosures in Volpenhein and Kenneally.

C. The Appellants' Response

Where one or more claim limitations are asserted to be inherent in a reference's teachings, the law requires that the requisite characteristic(s) must necessarily be present. MPEP § 2112 provides that the fact that a certain result or characteristic may occur or be present in the cited art is not sufficient to establish the inherency of that result or characteristic. Citing *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a

given set of circumstances is not sufficient.” Citing *In re Roberston*, 169 F.3d 743 (Fed. Cir. 1999). Moreover, “[i]n relying upon the theory of inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” Citing *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990). (Emphasis in original.) Appellants respectfully assert that the Examiner has not satisfied the foregoing requirements for supporting a rejection based on inherency, and thus, the rejections under 35 U.S.C. § 102(b) must be reversed.

As described above, the present invention relates to processes for the production of polyol fatty acid polyesters, which utilize constant reflux during transesterification to effectively remove alcohol by-products while retaining the fatty acid esters (having from about 8 to about 16 carbon atoms in the fatty acid chain) necessary for the reaction to continue. As is known in the art, reflux, by definition, requires certain conditions to be present. Among those are the following: first, the temperature and pressure of the reaction vessel must be such that the liquid will evaporate in the first instance; second, there must be a condensing device having a defined surface area, and an appropriate temperature and pressure, located downstream from the reaction vessel for collecting and condensing the evaporated liquid; and, finally, there must be a path for re-circulating the condensed liquid back into the reaction vessel while simultaneously removing unwanted by-products. Because these reaction conditions are not taught, either expressly or inherently, in any of the cited art, Appellants respectfully assert that the present invention is not anticipated.

Appellants respectfully assert that it is the foregoing second and third conditions that most clearly distinguish the claimed invention from the cited art. Reflux of the volatilized fatty acid esters does not automatically occur absent the proper reaction conditions. Rather, without such conditions, the volatilized esters will simply be removed from the reaction mixture along with other unwanted products. A discussion of the requisite reflux reaction conditions are set forth in the Specification. See e.g., page 11, lines 11-25.

In contrast to Appellants' teachings regarding employing conditions that result in reflux of the fatty acid ester, none of the cited art describes such reaction conditions. While each reference generally describes a method for preparing polyol polyesters that includes removal of lower alcohol by-product, none teach the use of reaction conditions needed to produce the desired reflux. Because the reflux would not occur without these conditions present, Appellants respectfully assert that the cited art fails to inherently teach the constant reflux required by Appellants' claims.



It is not surprising that the cited art did not discuss the notion of refluxing fatty acid ester starting materials. While the Examiner asserts that the cited art references disclose the use of fatty acid esters having chain lengths that overlap with Appellants', it is clear from their disclosures that the use of fatty acid esters much larger than those employed by Appellants was the emphasis in each case. For example, Rizzi indicates that "Mixtures of fatty acids derived from soybean oil, sunflower oil, safflower oil, and corn oil are especially preferred." See Rizzi at Col.3, lines 57-60. Volpenhein includes the same disclosure at Col.4, lines 18-21. And Keneally states that "Suitable triglycerides, fats and oils specifically include soybean oil, palm oil, cottonseed oil, safflower oil, rapeseed oil (high erucic acid), canola oil (low erucic acid), and corn oil." See Keneally Col. 4, lines 14-16. The working examples of all three references concern the use of these large, relatively non-volatile fatty acid esters. Thus, as there was no specific discussion of using the relatively smaller fatty acid esters defined by Appellants, there was simply no recognition of the problem of loss of fatty acid ester reactant using the reaction conditions described in those references.

In sum, contrary to the Examiner's conclusions, Appellants' respectfully submit that by following the teachings of the cited art, one does not necessarily achieve the fatty acid ester reflux conditions required by all of Appellants' claims. Appellants therefore respectfully assert that the Examiner has failed to establish that the presently claimed process is inherently disclosed in the cited art. Therefore, Appellants request that the rejection of Claims 1-28 under 35 U.S.C. §102 (b), based on inherency, be reversed.

#### CONCLUSION

It is respectfully submitted that the Examiner's rejection of Claims 1-28 under 35 U.S.C. § 102(b) is improper. Reversal of such rejection is therefore respectfully requested.

Respectfully submitted,

For John Howie *et al.*

By Carl J. Roof

Carl J. Roof  
Attorney for Appellants  
Registration No. 37,708  
Telephone: (513) 634-5209

APPENDIX A

Claim 1. A process for the preparation of polyol fatty acid polyester, comprising heating a mixture of polyol, fatty acid ester, emulsifying agent and catalyst under conditions sufficient to cause reaction of the polyol and the fatty acid ester, wherein the fatty acid chains of the fatty acid ester have from about 6 to about 14 total carbon atoms, wherein the emulsifying agent comprises a fatty acid soap having fatty acid chains of from about 16 to about 22 total carbon atoms, and wherein the mixture is heated at a pressure sufficient to maintain a substantially constant reflux rate of the fatty acid ester during the reaction of the polyol and the fatty acid ester.

Claim 2. A process according to claim 1, wherein the process further comprises the step of adding additional fatty acid ester after reaction of the polyol and original fatty acid ester has begun.

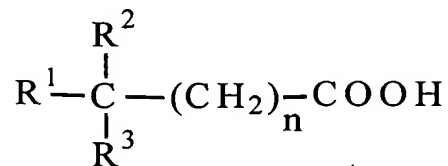
Claim 3. A process according to claim 1, wherein the degree of esterification of the polyol fatty acid polyester is at least about 70%.

Claim 4. A process according to claim 1, wherein the fatty acid chains of the fatty acid ester have from about 8 to about 12 total carbon atoms.

Claim 5. A process according to claim 1, wherein the fatty acid chains of the fatty acid ester have from about 8 to about 10 total carbon atoms.

Claim 6. A process according to claim 4, wherein the fatty acid ester comprises a branched chain fatty acid ester.

Claim 7. A process according to claim 6, wherein the fatty acid ester is prepared from an acid having the structure:



wherein  $R^1$  is a hydrocarbon,  $R^2$  and  $R^3$  are independently selected from hydrogen and a hydrocarbon,  $n$  is from 0 to about 11 and the acid has from about 6 to about 14 carbon atoms.

Claim 8. A process according to claim 1, wherein the fatty acid ester is obtained from an oil selected from the group consisting of coconut oil, fractionated coconut oil, and mixtures thereof.

Claim 9. A process according to claim 8, wherein the pressure is decreased during the heating step.

Claim 10. A process according to claim 8, wherein the pressure is in the range of from about 60 to about 190 mm Hg.

Claim 11. A process according to claim 1, wherein the polyol comprises sucrose.

Claim 12. A process according to claim 1, wherein the pour point of the polyol fatty acid polyester is not greater than about  $-15^{\circ}\text{C}$ .

Claim 13. A process according to claim 1, wherein the mixture is heated at a temperature in the range of from about  $115^{\circ}\text{C}$  to about  $150^{\circ}\text{C}$ .

Claim 14. A process according to claim 13, wherein the mixture is heated at a temperature of about  $135^{\circ}\text{C}$ .

Claim 15. A process according to claim 1, wherein the catalyst is selected from the group consisting of alkali metals; alloys of at least two alkali metals; alkali metal hydrides; alkali metal lower alkyls; alkali metal alkoxides of lower alcohols; carbonates and bicarbonates of alkali metals; carbonates and bicarbonates of alkaline earth metals; and mixtures thereof.

Claim 16. A process for the preparation of polyol fatty acid polyesters, comprising heating a mixture of polyol, fatty acid ester and catalyst wherein the fatty acid chains of the fatty acid ester have from about 6 to about 14 total carbon atoms and at least 50% the polyol's hydroxyl groups

are esterified and wherein the mixture is heated at a pressure sufficient to maintain a substantially constant reflux rate of the fatty acid ester during the reaction of the polyol and the fatty acid ester.

Claim 17. A process according to claim 16, wherein the polyol comprises sucrose.

Claim 18. A process according to claim 17, wherein the fatty acid chains of the fatty acid ester have from about 8 to about 12 total carbon atoms.

Claim 19. A process according to claim 18, wherein the fatty acid chains of the fatty acid ester have from about 8 to about 10 total carbon atoms.

Claim 20. A process according to claim 18, wherein the fatty acid ester comprises a branched chain fatty acid ester.

Claim 21. A process according to claim 16, wherein the fatty acid ester is obtained from an oil selected from the group consisting of coconut oil, fractionated coconut oil, and mixtures thereof.

Claim 22. A process according to claim 16, wherein the polyol fatty acid polyester has a pour point of not greater than about -15°C.

Claim 23. A process according to claim 16, wherein the mixture further comprises an emulsifying agent comprising a fatty acid soap having fatty acid chains of from about 16 to about 22 total carbon atoms.

Claim 24. A process according to claim 16 wherein no emulsifying agent is added to the mixture.

Claim 25. A process for the preparation of higher polyol fatty acid polyesters, comprising heating a mixture of polyol, fatty acid ester and catalyst to form a polyol fatty acid polyester wherein the polyol fatty acid polyester has a pour point of not greater than about -15°C and wherein the mixture is heated at a pressure sufficient to maintain a substantially constant reflux rate of the fatty acid ester during the reaction of the polyol and the fatty acid ester

Claim 26. A process according to claim 25, wherein the polyol comprises sucrose and the fatty acid chains of the fatty acid ester have from about 6 to about 14 total carbon atoms.

Claim 27. A process according to claim 25, wherein the fatty acid ester comprises a branched chain fatty acid ester.

Claim 28. A process according to claim 25, wherein the mixture further comprises an emulsifying agent comprising a fatty acid soap having fatty acid chains of from about 16 to about 22 total carbon atoms.